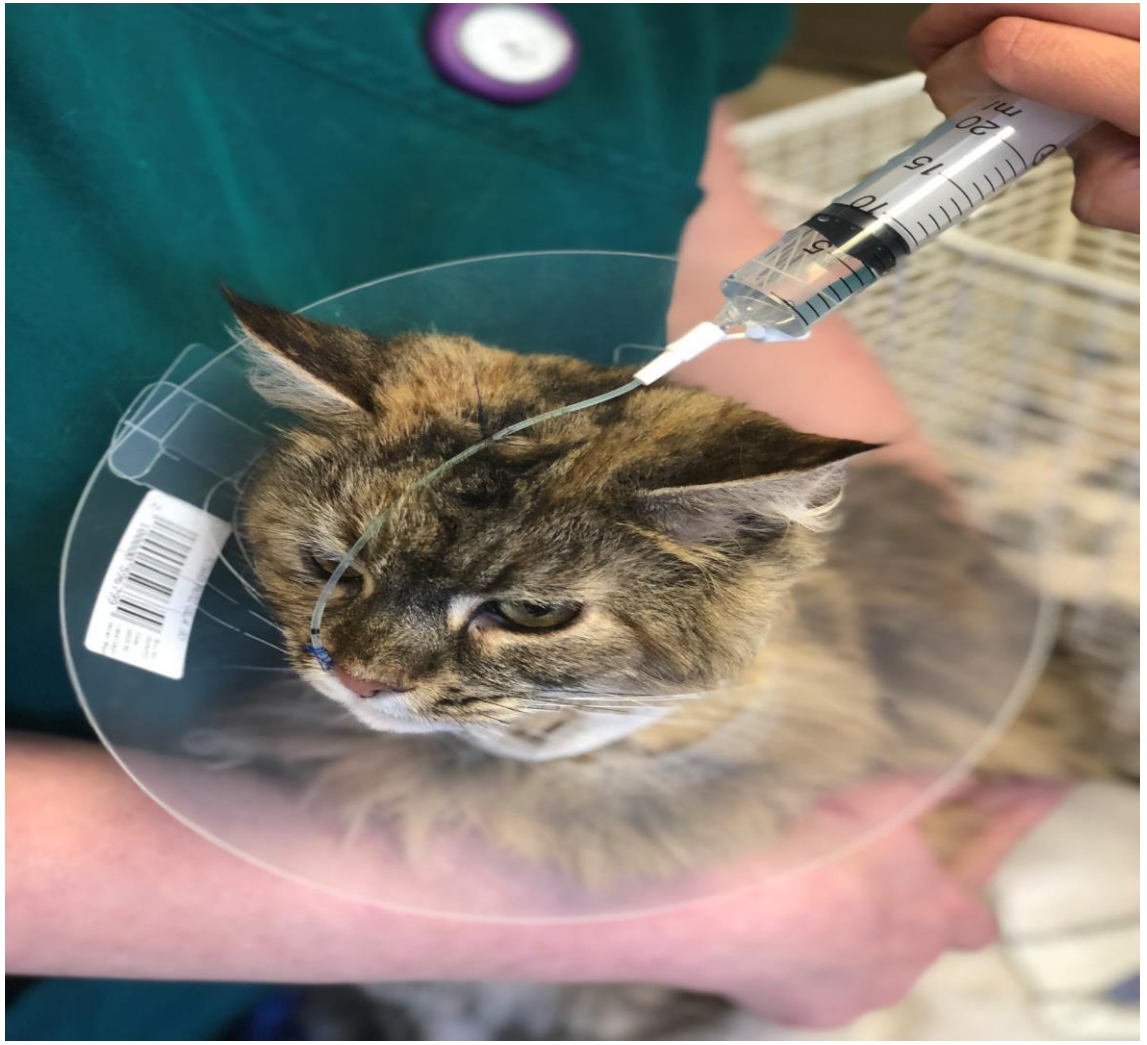
Comparative Critical Care Nursing

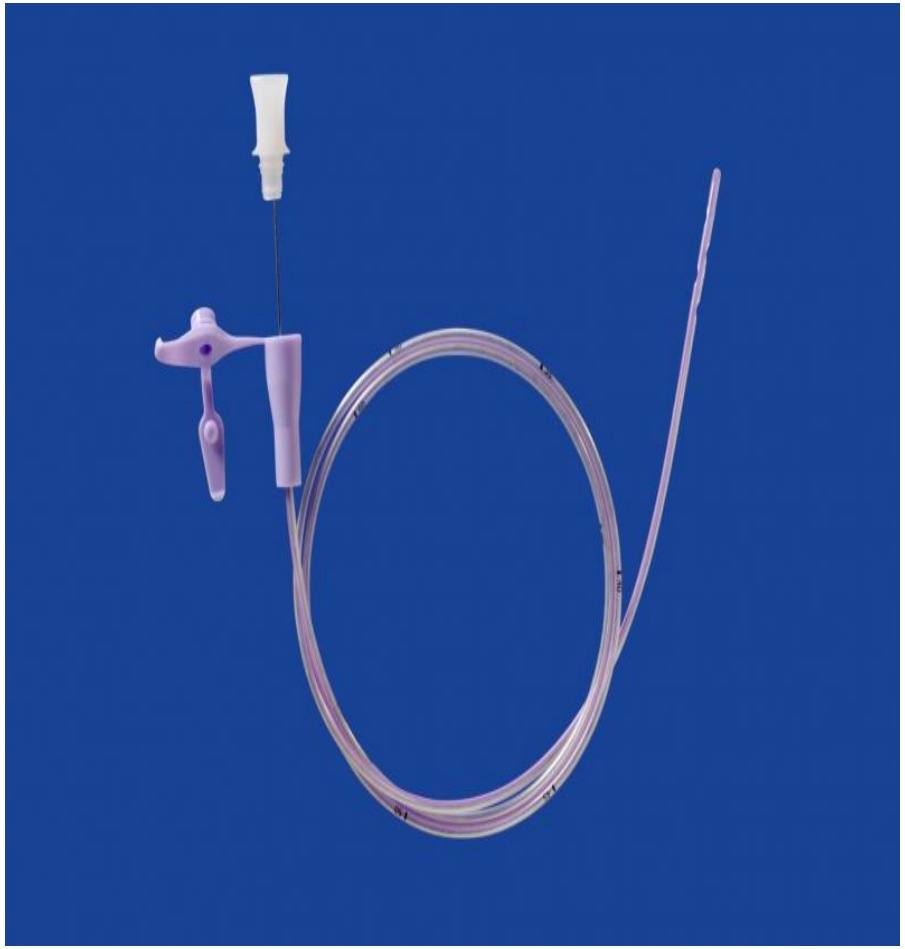
NG Tube Placement and Risk Factors: A Look at Veterinary and Human Comparisons



Lindsey Ashburner VTS(ECC) Cert VNECC AFHEA RVN

Why place a NG tube?

- Providing early enteral nutrition proven to improve patient outcome
- Aspiration of gastric content
- Administer oral medications*
- Easy to place and fairly inexpensive



Contraindications

- Vomiting
- Unconscious/loss of gag reflex
- Mega-oesophagus
- Facial trauma
- Coagulopathy
- Dyspnoeic
- Increased intracranial pressures

Naso-gastric VS Naso-oesophageal

Journal of Veterinary Emergency and Critical Care

Retrospective Study

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Comparison of complication rates in dogs with nasoesophageal versus nasogastric feeding tubes

Melissa K. Yu, BA; Lisa M. Freeman, DVM, PhD, DACVN; Cailin R. Heinze, VMD, MS, DACVN; Valerie J. Parker, DVM, DACVIM and Deborah E. Linder, DVM, DACVN

Abstract

Objective – To compare complication rates between nasoesophageal (NE) and nasogastric (NG) feeding tubes in dogs.
Design – Retrospective study.
Setting – University referral veterinary hospital.
Animals – A total of 46 dogs that were fed through a NE ($n = 28$) or NG ($n = 18$) tube between January 2007 and December 2011 and that also had either thoracic radiography or computed tomography performed so that location of the distal tip of the tube in either the esophagus or stomach could be confirmed.
Interventions – None.
Measurements and Main Results – The medical record of each eligible case was reviewed and data recorded included signalment, underlying disease, body weight, body condition score, medications, duration of feeding, diet used, and complications observed (ie, vomiting, regurgitation, diarrhea, early tube removal, clogged tube, epistaxis, pulmonary aspiration, hyperglycemia, and refeeding syndrome). Dogs with NE tubes were significantly younger than dogs with NG tubes ($P = 0.03$) but there were no other significant differences in signalment, underlying disease, medications, duration of anorexia, percent of resting energy requirement achieved, or change in weight during tube feeding. There also was no significant difference between the NE and NG groups for any of the recorded complications. Significantly fewer dogs in the NE group died or were euthanized (3/28) compared to the NG group (7/18; $P = 0.02$) but outcome was not associated with age, underlying disease, or any of the recorded tube complications.
Conclusions – This study did not identify a difference in complication rate between NE and NG feeding tubes in dogs. Additional studies are required to determine the optimal terminal location of feeding tubes in dogs.

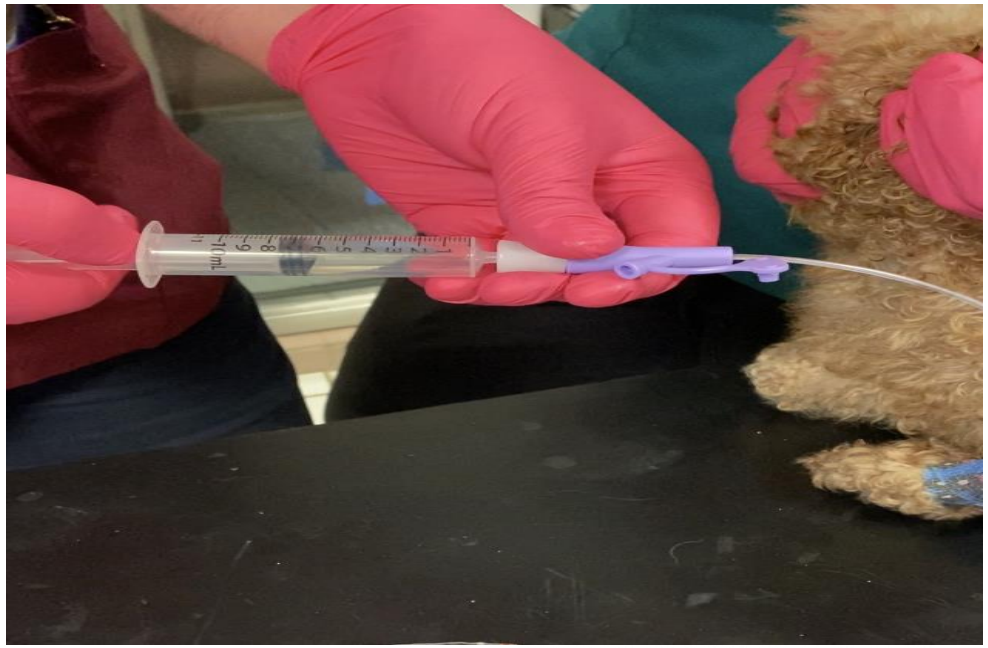
(J Vet Emerg Crit Care 2013; 23(3): 300–304) doi: 10.1111/vec.12048

NG tube placement

Suturing in place

Confirming placement

- Aspiration with a syringe to assess for a vacuum
- Laryngoscope visualisation?
- Instil sterile saline
- pH assessment of fluid aspirated
- Connect to portable capnograph and assess waveform and EtCO2



Confirming placement

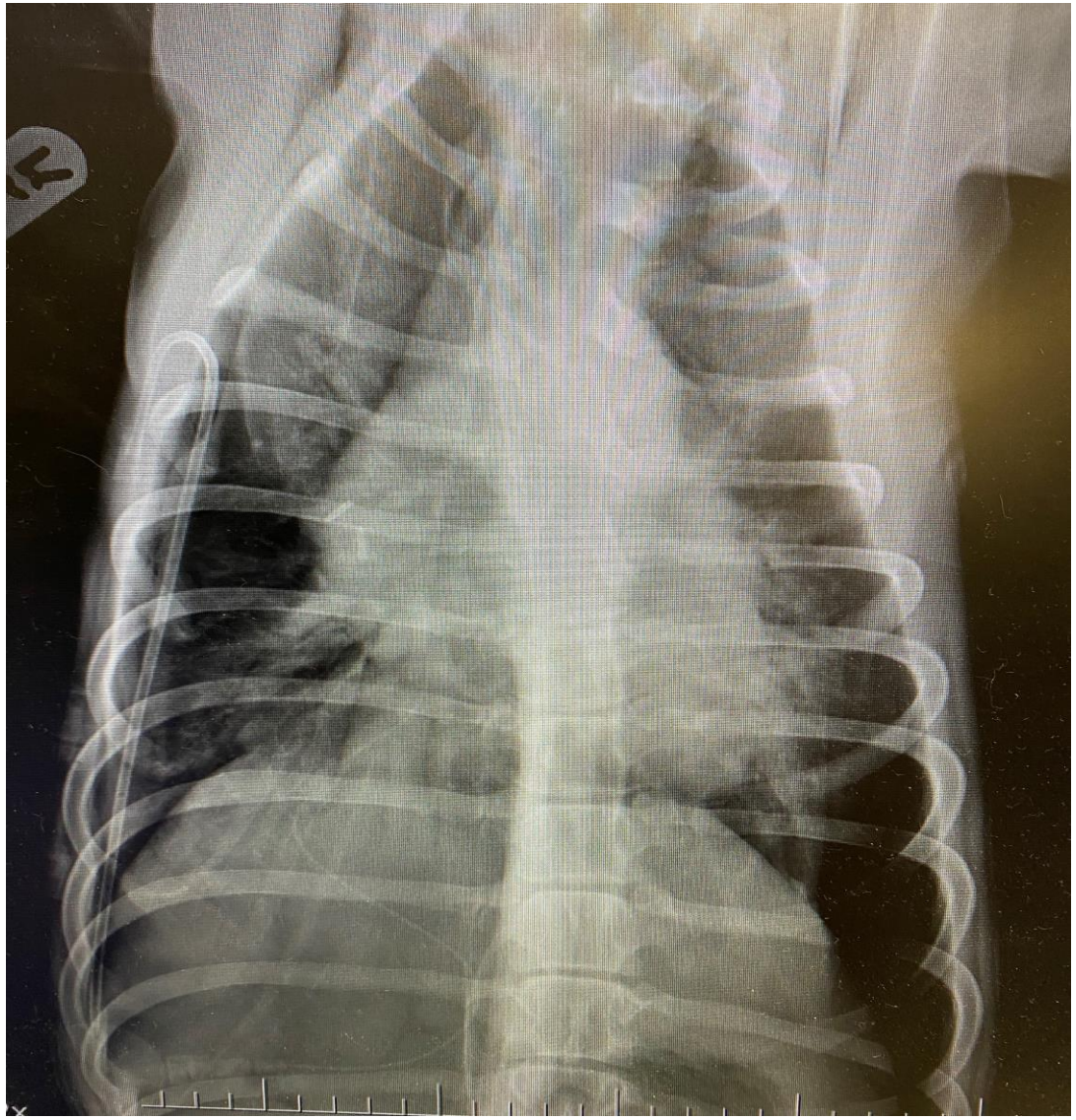
- Thoracic radiographs
- Include nasopharynx and oropharynx area to check for tube kinking/coiling

Complications associated with NG tubes

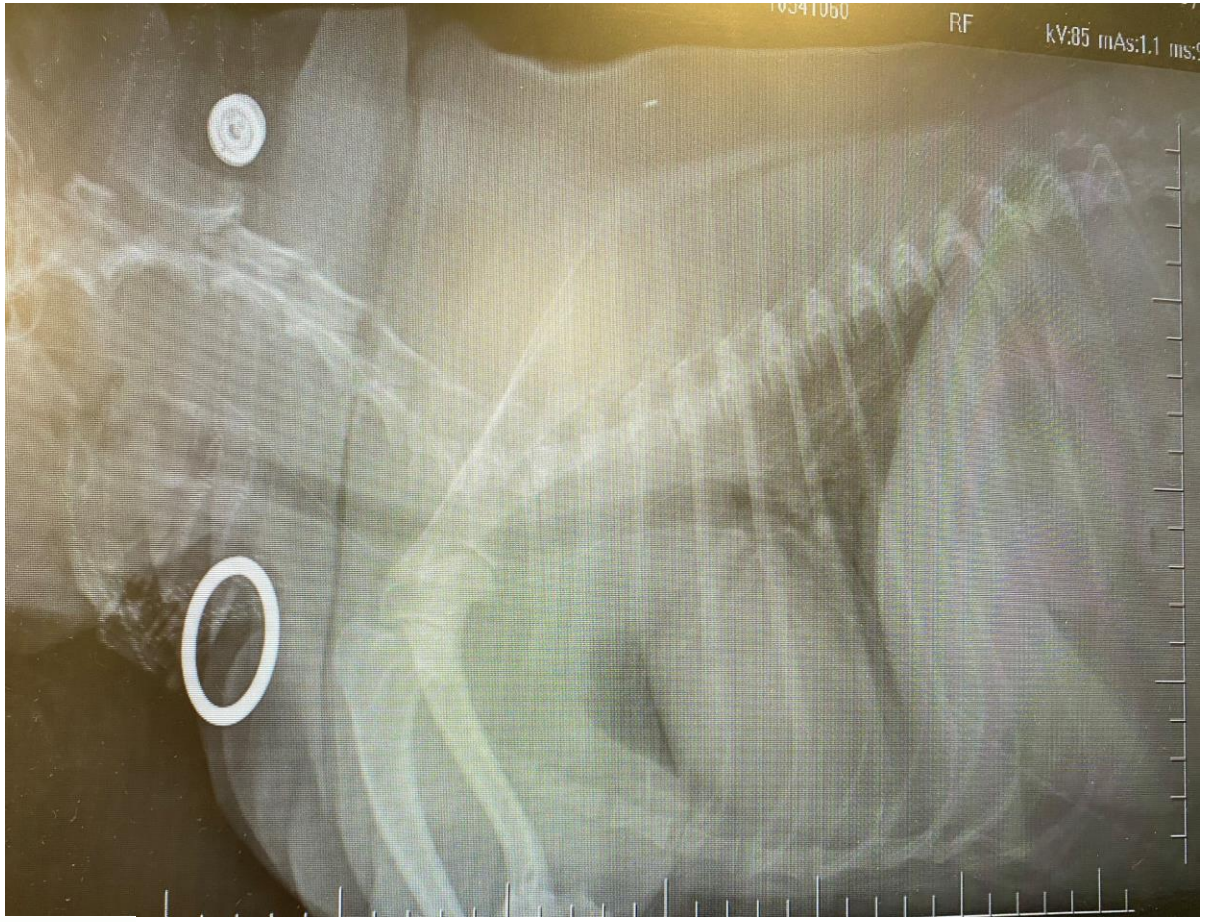
- Epistaxis
- Rhinitis/sinusitis/dacrocystitis
- Oesophagitis
- Tube blockage
- Tube dislodgement

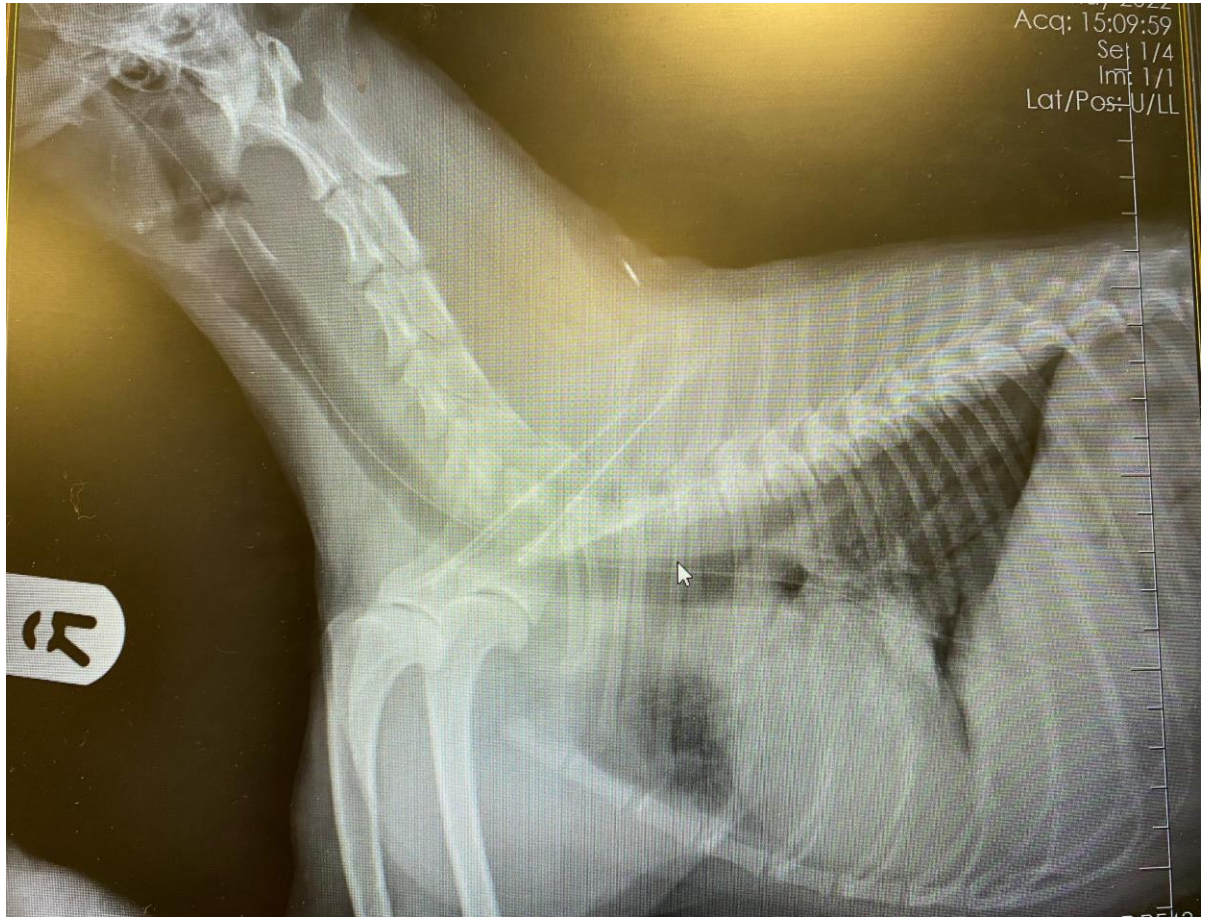
Complications associated with NG tubes

- Regurgitation/vomiting
- Aspiration pneumonia
- Fluid losses and electrolyte imbalances
- Iatrogenic pneumothorax



Radiographic confirmation





Complication rates?

CASE REPORTS

Fatal Complications of Nasogastric Tube Misplacement in Two Dogs

Jenniffer Rodriguez-Diaz, BSc, DVM, Julia P. Sumner, BVSc, MANZCVS, DACVS, Meredith Miller, DVM, DACVIM

ABSTRACT

Provision of enteral nutrition via the use of nasoenteric feeding tubes is a commonly used method in both veterinary and human medicine. Although case reports in human medicine have identified fatalities due to misplacement of nasogastric (NG) tubes into the tracheobronchial tree and subsequent pneumothorax, there are no case reports, to our knowledge, of fatalities in veterinary patients. This case report describes two fatalities caused by misplaced NG tubes in intubated patients (one intraoperative, one postoperative). This report highlights risk factors for feeding tube complications and methods to prevent future fatalities such as two-view radiography, two-step insertion, capnography, laryngoscopic-assisted placement, and palpation of the NG tube in the stomach. The recent fatalities discussed within this case series demonstrate that deaths as a result of NG tubes misplaced into the tracheobronchial tree occur in veterinary patients, and measures should be taken to prevent this complication. (*J Am Anim Hosp Assoc* 2021; 57:242–246. DOI 10.5326/JAAHA-MS-7104)

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Brief Clinical Communication

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A novel placement technique for nasogastric and nasoesophageal tubes

Jennifer M. Herring, DVM, MS, DACVECC

Abstract

Background – Early enteral nutrition in dogs and cats can have significant benefit in the therapeutic management of critical illness. Blind placement of nasogastric or nasoesophageal feeding tubes to accomplish this goal has become standard practice. However, complications from tube misdirection into the tracheobronchial tree can lead to significant patient morbidity and mortality. Safe and consistent alternatives are desirable to minimize these risks.

Key Concepts – A modified method for placement of nasoenteric tubes is described. The main variation from standard procedure involves a second tube measurement, with the distal tip of the tube positioned at the thoracic inlet and measured to the nostril. The tube is advanced to this level and tested for negative pressure using a 12 mL syringe attached to the end of the feeding tube. This improves confidence in esophageal positioning before complete advancement of the tube to its distal endpoint.

Significance – This procedural adaptation to feeding tube placement has the potential to reduce bronchopulmonary trauma from intratracheal misdirection by providing an early safety check to identify malpositioning. Prospective validation studies are needed to support its advantages over standard tube placement techniques.

(J Vet Emerg Crit Care 2016; 00(0): 1–5) doi: 10.1111/vec.12474

Keywords: enteral nutrition, feeding tubes, nutritional support

Veterinary Emergency AND Critical Care

Full Access

Capnographic documentation of nasoesophageal and nasogastric feeding tube placement in dogs

Paula A. Johnson DVM, F. A. Mann DVM, MS, DACVS, DACVECC, John Dodam DVM, MS, PhD, DACVA
... See all authors

First published: 17 December 2002 | https://doi.org/10.1046/j.1435-6935.2002.00042.x | Citations: 16

Abstract

Objective: To evaluate the ability of capnography to document proper placement of nasoesophageal (NE) and nasogastric (NG) feeding tubes. This study was conducted in 3 phases. Phase I of this study was designed in order to test the efficacy of capnography to distinguish placement of a feeding tube in the alimentary tract versus the respiratory tract. Phase II was designed in order to document that carbon dioxide (CO_2) could be measured through a polyvinyl chloride (PVC) feeding tube. Phase III was performed in order to evaluate the technique of continuous monitoring during insertion of the feeding tube into the esophagus and stomach as would be performed during a clinical-tube

Design: Prospective study.

Setting: Research laboratory.

Animals: 24 adult dogs.

Interventions: In Phase I, sedated dogs were instrumented with an intratracheal catheter and an 8 French feeding tube placed nasally into the distal esophagus and later advanced into the stomach. In Phase II, dogs were anesthetized and an 8 French feeding tube was placed down the endotracheal tube, then into the esophagus and later advanced into the stomach. In Phase III, sedated dogs were instrumented with an 8 French feeding tube inserted intranasally and then advanced to the level of the nasopharynx, distal esophagus and, lastly, the stomach. Fluoroscopy was used in order to determine location of the feeding tube.

Measurements and main results: Phase I measurements included respiratory rate and CO_2 from the trachea, esophagus, and stomach and pH of gastric fluid sample. Phase II measurements included respiratory rate and CO_2 from the endotracheal tube, feeding tube in the endotracheal tube, feeding tube in the distal esophagus, and feeding tube in the stomach. Phase III data collection included respiratory rate and CO_2 as the tube was passed through the nasal cavity, nasopharynx, esophagus and stomach. Phase I fluid samples were collected from 5 of the 9 dogs and had pH values from 1.68 to 4.20. In both phases, values for the respiratory rate and CO_2 from the esophagus and stomach were 0 ± 0, significantly lower ($P < 0.001$) than the values from the trachea. In Phase II, there was no significant difference between the respiratory rates ($P = 0.886$) and CO_2 ($P = 0.705$) readings obtained from the endotracheal tube compared to readings from the feeding tube in the endotracheal tube. In Phase III, there was a significant difference ($P < 0.001$) between the respiratory rates and CO_2 readings obtained from the nasal cavity and the nasopharynx when compared to those readings obtained from the esophagus and stomach. Measurement of CO_2 and respiratory rate resulted in a reading of 0 every time the feeding tube was in the esophagus or stomach.

Conclusions: Capnography may be used in order to detect airway placement of NE and NG tubes.

Thank you!

BACCN
British Association of Critical Care Nurses

baccn.vccn@gmail.com

instagram.com/vccnuk